PIH20
SMALL BENEFITS OF THIRD TRIMESTER CHECK-UP AMONG PREGNANT WOMEN POSITIVELY SCREENED FOR THYROID DISORDERS
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OBJECTIVES: The guidelines of American Thyroid Association (ATA) 2011 recommends in hypothyroid women receiving levothyroxine (LT4) and in untreated women with subclinical hypothyroidism and/or positive TPOAb (antibodies against thyroid peroxidase) regular laboratory check-up every 4 weeks during the 1st half of pregnancy and at least once between 26th–32th weeks of gravidity. Our aim was to verify whether thyroid check-up between 26th–32thgestation weeks is beneficial in terms of LT4 dosage changes. **METHODS:** We performed a retrospective cross-sectional study in 2004–2014 in the Departments of Endocrinology of a university hospital and with laboratory assessment in a single center. The study included 188 women positively screened for hypothyroidism and/or positive TPOAb in first trimester of pregnancy. They were followed and examined according to the recommended algorithm by ATA 2011. We assessed serum concentrations of TSH, FT4 and TPOAb and evaluated changes of LT4 dosage with regard to week of laboratory check-up. Finally, we calculated direct medical costs per LT4 dosage change. **RESULTS:** Of the 188 positively screened women in the first trimester, 104 (55.3%) were hypothyroid and 84 (44.7%) were euthyroid but TPOAb positive. Overall, 104 women (55.3%) undergo three laboratory check-ups, 57 (30.3%) four check-ups and 27(14.4%) five check-ups. The median entrance dose of LT4 was 50ug/day (range 0 –170ug/day). The Laboratory check-up between 26th–32th gestation weeks led to LT4 dosage change in 18/132 (13.6%) women comparison to 131/167 (35.7%) in 10th week, 55/142 (38.7%) in 14th week and 43/165 (26.1%) in 20th gestation weeks ($p<0.001$). Average costs per LT4 dose change per women were 34.71EUR in 10th week, 47.01EUR in 14th week, 65.01EUR in 20th week and 127.53EUR in 30thgestation weeks. **CONCLUSIONS:** Thyroid check-up between 26th–32th gestation weeks in women with hypothyroidism and/or positive TPOAb seems to be redundant in terms of LT4 dosage changes and produces inadequate high costs.

PIH21
MODELLING THE COST DETERMINANTS FOR OLDER PERSONS' TRANSITIONS IN CARE (OPTIC)
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OBJECTIVES: The transfers of nursing home (NH) residents to the emergency departments (ED) is costly for the healthcare systems. In this regard, the cost-analysis can be a useful tool to provide evidence-based information to guide resource allocation. In this study, we analyze the cost at different stages of the transitions for Edmonton, Alberta, in Canada and evaluate the extent to which nursing home attributes, patients' characteristics, and the transfers' outcomes are significantly associated with the transfers cost. **METHODS:** We used a representative data collected in 2011 from 398 residents and 28 nursing homes in Edmonton, Alberta from multiple levels and sources (facility, residents, healthcare providers, health records, administrative databases, etc.). We conducted a preliminary study to describe the costs at different stages of the transitions. Statistical modeling was used to identify any significant predictors of the transfers cost and estimate the magnitude of their impact. We investigated the ordinary least squares (OLS) models, the GLM, and the mixed effects regression models for clustered data. Models are assessed based on standard goodness-of-fit tests. **RESULTS:** We find that hospitalization represents 48% of the transfers total cost, whilst the emergency-department nursing cost and the nursing-home cost account for 26% and 10% respectively. The emergency-Medical-Services account for 10%, and the diagnostic cost represents 3%. The physicians plus consultations and the treatment costs represent 2% each. The estimation results show that sociodemographic factors, health characteristics, communication of information, healthcare providers' involvement in the decision, the nature of the transfer coordinator, and providing medical care in the nursing home are significant predictors of the transfers cost. **CONCLUSIONS:** The results of this analysis may fit into a subsequent cost-effectiveness analysis for the transfers cost.

PIH22
COST-EFFECTIVENESS OF CYP2D6 GENOTYPING IN OLDER DEPRESSED PATIENTS, STARTING WITH NORTRIPTYLINE THERAPY
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OBJECTIVES: Genotyping for the cytochrome P450-2D6 has the potency to predict differences in metabolism of nortriptyline. This information could optimize treatment. We explored if possible benefits could outweigh genotyping costs for Dutch depressed patients in clinical psychiatry. **METHODS:** First, a decision-tree was created to model the first weeks of nortriptyline therapy. In the model, costs of hospitalization, therapeutic drug monitoring, and drug costs were captured. Based on the patients genetics, patients were distributed among three health states: correctly, sub-, or supra-therapeutically dosed. Utilities for each of these health states and at different points in time were obtained from an expert opinion (nine clinicians). Second, an improvement in sub or supra-therapeutically dosed patients to correctly dosed patients, was simulated, assuming genotyping would prevent under or overdosing. In the base case the improvement was 36%. In addition, we assumed genotyping could reduce hospitalization days with a maximum of 3.7 days (average: 28.6 days). Results from the model without genotyping were compared with the genotyping model. In a scenario analyses we varied the effects of genotyping to reach cost-effectiveness at €20 000/quality adjusted life year (QALY) or €50 000/QALY. In a univariate sensitivity analysis, effects of lowering genotyping costs were examined. A probabilistic sensitivity analysis (PSA) was performed to investigate influence of parameter uncertainty. **RESULTS:** In the base case, the incremental cost-effectiveness ratio (ICER) was €32 697/QALY. For an ICER of €20 000/QALY, a genotyping facilitated improvement of 45% was needed and for €50 000/QALY this was 27%. Lowering the genotype price to €162 made genotyping cost-saving. Results of the PSA indicated a probability of 0.95 for a willingness-to-pay threshold of €46000/QALY. **CONCLUSIONS:** Genotyping could be cost-effective and even be cost-saving when genotyping costs drops. However, there is a need for more clinical evidence to support assumptions made in this model.

PIH23
ECONOMETRICS ANALYSIS OF NON-PRESCRIPTION MEDICINES EXPENDITURE AT COMMUNITY PHARMACIES IN MALAYSIA
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OBJECTIVES: The purpose of this study was to develop the econometric model predicting the non-prescription medicines expenditure at community pharmacies in Malaysia **METHODS:** This study used data from 2009 Non-Prescription Medicines Utilization among Community Pharmacy Patrons in Malaysia (COMPACT1) and Sales of Non-Prescription Medicine in Community Pharmacy Malaysia (COMPACT2). The prices of non prescription medicines (NPM) in 2009 were updated to prices of 2014, based on Malaysian Consumer Price Index. There were four major components in the empirical model namely; socio-economic characteristics, health status, utilization behavior and community pharmacy data. The dependent variable was the logarithm function of expenditure for purchasing the NPM. Ordinary least square method on cross-sectional data was used to predict model of NPM among community pharmacy patrons. **RESULTS:** Twenty two percent (22.3%) of variation in NPM expenditure was explained by socio-economic characteristics, health status, utilization behavior, and community pharmacy data. Age, female, living at urban area, and had monthly household income more than RM3000 per month (~USD850) were found to have linear positive relationship with money spent. Those customers who had problem in pain or discomfort had 0.059 units lesser in expenditure of NPM. Number of medicines purchased, satisfaction towards price, usage frequency of medicines, and the ways of product selection were among variables in utilization behavior that had significant linear relationship with NPM. The community pharmacy data on the working days and percentage of customers purchasing over total customers in a month shows significant negative linear relationship with NPM expenditure. **CONCLUSIONS:** The study had given additional insight on the economics of self-medication and the role of community pharmacy as supplier of health care. The expenditure of NPM in Malaysia can be explained by empirical model that includes the purchasers' socio-economic characteristic, health status, NPM utilization behavior and the information regarding utilization of community pharmacy.

INDIVIDUAL'S HEALTH – Patient-Reported Outcomes & Patient Preference Studies

PIH24
MEDICATION ADHERENCE AND HEALTH EXPENDITURE COMPARISON OF ATENOLOL AND METOPROLOL IMMEDIATE AND EXTENDED RELEASE FORMS
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OBJECTIVES: The medication adherence of patients using widely prescribed beta blockers (Atenolol and Metoprolol) in their extended and immediate release salt form remains unidentified. Improving medication adherence has been shown to reduce health care costs. Analyzing the treatment having maximum medication adherence could reduce overall healthcare costs, offsetting the cost of the medication itself. The objectives of this study are to 1) compare the medication adherence of patients prescribed with Atenolol and Metoprolol in both immediate and extended release forms 2) determine the difference in healthcare expenditure between those highly adherent to the beta-blockers under study. **METHODS:** Secondary data analysis using the Medical Expenditure Panel Survey (MEPS) conducted by the Agency for Healthcare Research and Quality and the National Center for Health Statistics. Medication Possession Ratio (MPR) will be used to calculate the medication adherence. Patients will then be divided into three categories: high adherence (80-100%), intermediate adherence (79%-60%), and low adherence (< 60%). Healthcare expenditure will be analyzed for each medication. Healthcare expenditures will then be compared between those who are highly adherent to each medication. Healthcare costs analyzed will include ER, outpatient, inpatient visits and prescription medication payments. **RESULTS:** The patients with Atenolol extended release were associated with the lowest adherence. Patients with Metoprolol treatment were more adherent than those taking Atenolol ($p<0.0001$). Also, within the extended release group, Metoprolol Succinate had a greater rate of high adherence than Atenolol ($p<0.001$). For patients with high medication adherence, the expenditure was the lowest for Metoprolol Succinate ($12490.33). Also, for immediate release, Metoprolol Tartrate has significantly lower healthcare costs. **CONCLUSIONS:** Metoprolol is associated with higher adherence than atenolol. Also, the healthcare expenditure for Metoprolol is significantly lower than Atenolol.

PIH25
A SYSTEMATIC REVIEW OF THE USE OF THE TIME PREFERENCE MODEL TO EXPLORE MEDICATION ADHERENCE BEHAVIOR
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OBJECTIVES: Non-adherence to prescription medication has a significant impact on a patient's health; often causing poorer health outcomes, preventable mortality and unnecessary utilization of healthcare services. Previous literature has been inconsistent as to what factors affect a patients' adherence to prescription medication. Time preference, the extent that individuals are willing to discount future benefits for immediate benefits, has recently been acknowledged as a framework

to understand patient behavior, however, the relationship between time preference and medication adherence is not widely understood. This study aims to summarize the existing literature on the association between time preference and medication adherence. **METHODS:** A literature search was conducted on Medline, PsycInfo, PubMed and CINAHL from January 2000 to 2015 using the keywords "time preference", "patient compliance", "medication adherence" and "non-adherence". Studies that did not include medication adherence, lacked empirical data on time preference or assessed time preference with addictive behaviors (e.g. smoking) were excluded. A table summarized results, including the publication year, author, study design, source and findings. **RESULTS:** A total of 53 articles were identified and nine studies were retained. Only three studies directly investigated the relationship between time preference and medication adherence. Of those, studies in 2001 examined adherence to hypertension medication in 195 older adults and adherence to cholesterol lowering medication in 169 adults. Findings revealed weak to no association between time preference and medication adherence. Conversely, a 2013 study reported time preference as a significant predictor of medication adherence to asthma control medications for 47 patients with persistent asthma. **CONCLUSIONS:** Taking into account the extent to which patients will worry about adverse future outcomes, this review identified very few studies addressing the objective. More empirical research must be conducted before any conclusion can be made in regard to the impact of a patients' time preference on their medication adherence behaviors.

PIH26

A COMPREHENSIVE SURVEY OF MANAGED CARE ORGANIZATION (MCO) MEDICATION ADHERENCE INTERVENTION PROGRAMS

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OBJECTIVES: Medication non-adherence causes hundreds of billions of dollars in avoidable costs. This study sought to survey the existing medication adherence programs of managed care organizations (MCOs). **METHODS:** Thirty MCOs were interviewed in Spring 2014 about their current and future medication adherence programs. 19 small (<200,000 members) and 11 large (≥200,000 members) filled out a 19-question (excluding 6 on program characteristics) survey covering the strategies and methods used to improve patient adherence. **RESULTS:** The MCOs dedicate the majority of adherence resources toward cardiovascular disease states but most are looking to expand to more disease states. Just two (7%) of the MCOs surveyed use predictive analytics to target patients for their intervention programs while 12 (40%) use retrospective adherence measures. 75% of MCOs are looking to expand their adherence programs while 60% specifically plan to use predictive analytics in the future. Only two (7%) only used outsourced interventions, 10 (33%) used in-house and 18 (60%) used some combination of the two. 20 (67%) MCOs used live call interventions and only 2 (7%) used text reminders. 14 small (74%) and 9 (82%) large MCOs used direct mail interventions. 20 (67%) of the MCOs rated their intervention programs to be "moderately effective." **CONCLUSIONS:** Most MCOs prioritize adherence to cardiovascular disease medication but most are also interested in expanding their programs. Few MCOs use enhanced platforms to select patients for interventions but many plan on expanding their platforms. MCOs intervened to improve adherence largely through provider-centric channels and with a combination of in-house and outsourced methods. Many MCOs are interested in adopting a platform that identifies high-value interventions, like AllazoHealth, since current programs aren't personalized and are perceived as ineffective.

PIH27

PREDICTING MEDICATION ADHERENCE AND HEALTHCARE COSTS IN A MANAGED CARE POPULATION

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OBJECTIVES: To develop and validate predictive models that identify members with higher risk of medication non-adherence and increased total healthcare cost over a 12-month period in a managed care setting. **METHODS:** The study included members insured under a commercial healthcare plan who filled ≥ 1 prescription for any of seven targeted medication classes for common chronic diseases between October 2010 and May 2014. Pharmacy and medical claims during the four months before and six months after the member's first prescription for a targeted medication (index date) were used to generate 85 baseline member variables. These variables were tested for potential model inclusion to separately predict medication non-adherence (proportion of days covered <80%) and total healthcare costs during the 12-month follow-up period. Total costs included pharmacy and medical costs from outpatient, emergency room, and inpatient visits. Members were randomized 3:1 to the development or validation samples. The development sample was used to estimate and refine model parameters. The validation sample was used to evaluate the final model's performance based on c-statistic and R-squared values. Medication non-adherence was predicted using a logistic model. Total healthcare cost was predicted via a generalized linear model with a log link function and gamma distribution. **RESULTS:** Among the 70,502 and 23,505 members included in the development and validation samples, respectively, baseline prevalence of medication non-adherence ranged from 37% to 73%, depending on the medication class. Baseline adherence and cost were the most important predictors. Predictive performance improved when other variables, such as member demographics and comorbidities, were added to the baseline adherence only model (c-statistic increased from 0.81 to 0.89; $p<0.0001$). The cost model's R-squared value was 0.43. **CONCLUSIONS:** The models demonstrated good predictive performance and could be used together to identify members with potential non-adherence to medications and greater healthcare costs for intensive clinical interventions.

PIH28

A REVIEW OF THE EFFECTIVENESS OF VISUAL MEDICATION TOOLS IN BOOSTING PATIENT ADHERENCE AND REDUCING HOSPITAL ADMISSIONS

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OBJECTIVES: Thirty-two million Americans use three or more medications daily. Approximately 75% of patients fail to adhere to physician prescribed treatment regimens. The economic impact of non-adherence is estimated to cost $100 billion annually. Evidence suggests that the elderly are one of the largest groups contributing to the economic burden associated with non-adherence. Studies support the development of visual focused tools to improve adherence among older persons. The aim of this study was to explore the use of visual adherence tools in the hospital, clinic, and home settings to determine effectiveness in improving patient adherence and negating hospital readmissions. **METHODS:** Electronic databases such as PubMed and Google Scholar were searched from 2000 – 2014. Key words were "visual," "adherence," "elderly," "readmissions," and "visual adherence tool." Studies were included if they were conducted outside of the U.S. since few U.S. studies examined visual adherence tools. A custom-designed table included year of publication, author, study design, intervention, findings, and sources. **RESULTS:** A total of 24 articles and economic evaluations were retrieved. Older adults are the largest users of prescription medication. Whilst evidence suggests that visual medication adherence tools are useful, the tools are not being widely used in hospitals. This may be due to lack of knowledge about benefits. Exploration in psychology and marketing denotes that humans have a cognitive preference for picture-based, as opposed to text-based information. Reports have shown that pictorial aids expand recall, comprehension, and adherence. These instruments can also be particularly valuable for conveying dosage times, instructions on when to take medicine, as well as the importance of completing a course of therapy. Studies show that older persons prefer medication tools that focus on visual characteristics such as large print and simplified information. **CONCLUSIONS:** Several studies focused on the clinic and home setting, but few were hospital based. Further research is warranted.

PIH29

ASSESSMENT OF LEVEL OF MEDICATION ADHERENCE IN DIFFERENT NON-COMMUNICABLE CHRONIC DISEASES PATIENT IN QUETTA, PAKISTAN: DOSE DISEASE CONDITION PRODUCES ANY CHANGE

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OBJECTIVES: This study aimed to assess the level of medication adherence among patients with different non-communicable chronic diseases in Quetta Baluchistan, Pakistan. **METHODS:** A cross sectional study was conducted in different non-communicable chronic diseases patient, visiting outpatient department in public/private hospitals and clinics of Quetta, Pakistan. Morisky Medication Adherence Scale (Urdu version) was used to collect the data. The descriptive statistics was used to present the demographic and disease related information. Inferential statistics was used to the evaluation relationship among study variables. All analyses were performed using SPSS 20.0. **RESULTS:** A total of 505 patients with different non- chronic diseases (Diabetes, Hypertension, Heart diseases, Asthma and others) were enrolled for the present study. The mean age of the patients was 44.9 years, majority 304 (60.2%) were females. There were 228, 134, 37, 32 and 74 patients for diabetes, hypertension, heart diseases, asthma and others respectively. There was significant statistical difference ($p = 0.004$) as present mean mediation adherence scores in different non-communicable chronic diseases condition (5.34, 5.05, 4.65, 4.69, 4.59 for diabetes, hypertension, heart diseases, asthma and others respectively) **CONCLUSIONS:** The present study concluded that different disease conditions did affect the level of medication adherence, efforts should be made to provide specified health education to improve medication adherence in different disease condition for better therapeutic outcome.

PIH30

ASSESSMENT OF MEDICATION ADHERENCE AMONG PATIENTS WITH NON-COMMUNICABLE CHRONIC DISEASES IN QUETTA BALUCHISTAN, PAKISTAN

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OBJECTIVES: This study aimed to assess the level of medication adherence among patients with non-communicable chronic diseases in Quetta Baluchistan, Pakistan. **METHODS:** A cross sectional study was conducted among patients with non- chronic diseases, visiting outpatient department in public/private hospitals and clinics of Quetta city. Morisky Medication Adherence Scale (Urdu version) was used to collect the data. The descriptive statistics was used to present the demographic and disease related information. Inferential statistics was used to the evaluation relationship among study variables. All analyses were performed using SPSS 20.0. **RESULTS:** A total of 505 patients with non- chronic diseases (Diabetes, Hypertension, Heart diseases, Asthma and others) were enrolled for the present study. The mean age of the patients was 44.9 years, majority 304 (60.2%) were females. The proportions of diseases were; diabetes (45.1%) hypertension (26.5%) heart diseases (7.3%) asthma (6.3%) mainly and other (14.7%). A very small proportion of the patient 11.1% were having good medication adherence while 27.9% were having moderate adherence and 61.0% exhibited poor adherence. **CONCLUSIONS:** The study concluded that level of medication adherence among patients with non- communicable chronic disease was very poor, efforts should be made to identify the factors associated with non-adherence so that level of adherence should be improved to achieve better therapeutic outcome.

PIH31

DESCRIBING MEDICATION ADHERENCE ACROSS A POPULATION: THE VALUE OF CONSIDERING MULTIPLE MEASURES

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